Romoland plant on cutting edge of turning trash into electricity

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Video: Inland company converts waste to energy

On a corner in Romoland not far from the bustle of Interstate 215, a rag-tag crew has assembled from the ground up a plant that observers say will be the nation's first working example of an oxygen-deprived technology that turns trash into electricity.

Crew members have used motors from a power plant they helped disassembled on an Indian reservation, bought boilers from an old factory in Riverside, and pulled underground tanks found at the site to forge a maze of cylinders, scrubbers and a conveyer belt.

"We bought a lot of stuff we could get from salvage to build this plant so we could afford it," said Karen Bertram, president of International Environmental Solutions Corp. "We actually recycled a lot of stuff."

Essentially, the "pyrolysis" system decomposes trash at high temperatures without oxygen and turns it into carbon char residue. That process releases gas that generates heat, which then creates steam to power turbines that generate electricity.

Although regulatory hurdles remain, many experts and observers agree the technology being developed by the company on 8.5 acres in the town north of Temecula holds promise. The idea would be to then build larger plants elsewhere, Bertram said.

During a recent tour of the operation, Bertram gestured toward to a pile of shredded waste about to be swallowed by the humming machinery.

"If you put diapers in a landfill, it takes five years to degrade," she said. "We do it in 20 minutes."

At the end of the process, the machinery coughs out pellets of charred carbon -- what's left of the diapers and the rest of the trash.

"We believe in reduce, recycle and reuse -- and then this," Bertram said. "There's no such thing as zero waste, but we can reserve the energy of what's left."

Once turbines are installed at the site, there will be enough electricity coming from the heat-generated steam

to start producing electricity, Bertram said.

Looking for Success

The technology being developed by International Environmental Solution has caught the attention of officials in Los Angeles County.

Officials there are looking for remedies for diminishing landfill space and the need to transport trash elsewhere, said Coby Skye, an associate civil engineer for the Sanitation Districts of Los Angeles County.

The county evaluated hundreds of companies that use various technologies to get rid of trash before narrowing the field to four -- including Bertram's company.

"As we have less capacity for landfill disposal and energy costs rise, these technologies increase in value, and makes these much more economically valuable," he said.

Skye said a number of factors put International Environmental Solutions on the short list. The technology has been tested on municipal solid waste, and the company had solid data on emissions and the amount of energy that can be generated, he said.

"They had to meet very stringent criteria in terms of their environmental performance and economic stability in order for them to make the cut," he said.

The county has an Aug. 15 deadline for those four companies to submit a site-specific proposal in Southern California, Skye said. Bertram said her proposal will involve the Robert A. Nelson Transfer Station in Riverside, where her company would build a pilot pyrolysis operation.

Besides Los Angeles County, officials in Riverside County and as far away as Turkey are keeping on an eye on the company's progress as it navigates the permit process in a region known for stringent air-quality rules. Other companies using the same technology have built plants in Japan and Europe.

"If you can build it here in the South Coast Air Quality Management District, you can probably build it anywhere," said Hans Kernkamp, general manager and chief engineer for Riverside County's Waste Management Department.

Kernkamp said Riverside County had initial talks of using a waste-to-energy technology at the Edom Hill transfer station, east of Desert Hot Springs. Bertram's company was on the short list until the project fell by the wayside, he said.

Although Kernkamp thinks the technology needs to be proved on a larger scale, he said he hopes Bertram's company gets chosen by Los Angeles County.

"They're the home team ... and we'd like to see them be successful," he said.

An Experiment

The eight people who work at International Environmental Solutions are led by Bertram, formerly a corporate attorney in Texas who now drives her hybrid Toyota Prius from Orange County to Romoland.

Work started in 1999, but with a different purpose: to reactivate carbon so it could be used again to rid water of certain chemicals. Bertram turned to the trash business after a large competitor built a carbon-reactivation plant and cornered the market, she said.

It began a few years ago, she said, when folks from the California Integrated Waste Management Board and

UC Riverside's Bourns College of Engineering asked Bertram to consider converting the reactivated carbon system it into a pyrolytic conversion plant because they wanted to see how well it would work.

Plus, Bertram realized how many landfills were about to close and how the system could produce renewable energy.

"We did it and we found out we did it well. But I didn't think it would be this big," she said, noting that the process can take care of not only typical household trash, but also medical waste, tires, horse manure and hazardous waste.

Along with Bertram are a father-son team, Cameron and Toby Cole, who have backgrounds in fabrication. While engineers have consulted on the facility, there are no Ph.D.s, Bertram said.

"We're like wildcatters," Bertram said.

Big Need, Small Steps

Folks from horse-friendly Norco took a tour of the Romoland plant recently to see if the process could be used to turn the town's ample supply of manure into carbon char.

A study is under way to determine if a pyrolysis system built by International Environmental Solutions could be located at Norco's sewage treatment plant, and also power it, thereby saving the city $1 million, Mayor Frank Hall said. The study should be completed in the next two months, he said.

Both Kernkamp and Skye said the so-called waste conversion technologies such as pyrolysis have a drawback in that the state wouldn't give cities credit for keeping the trash out of landfills.

State law requires cities to keep 50 percent of trash from ending up in landfills, and most of it is done through recycling.

Fernando Berton, manager of research and applied technology for the California Integrated Waste Management Board, said that's the way the law was written.

Kernkamp said the volume of waste now being processed by the pyrolysis system is minimal compared to what's taken into the Nelson transfer station.

"A pilot facility would take 100 tons a day," he said, while the transfer station now processes 3,000 tons a day.

"Before we start talking about this being a substitute, we've got a long way to go," Kernkamp said. "But we have to take these steps."

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